Source Water Assessment Program (SWAP) Report
For
Northfield Mountain Station and Visitor's Center

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
April 27, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	**Northfield Mountain Station & Visitors Center**
PWS Address	**99 Millers Falls Road**
City/Town	**Northfield, Massachusetts**
PWS ID Number	**1217003**
Local Contact	**Mr. Robert Perry**
Phone Number	**413-659-4468**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well A	01G	100	420	Moderate
Well B	02G	191	490	Low

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. DESCRIPTION OF THE WATER SYSTEM

Northfield Mountain Station & Visitor's Center is a pumped storage, hydroelectric generating station and outdoor recreation facility owned by Northeast Generation Company and operated by Northeast Generation Services Company. The power generating facility is located approximately eight hundred feet below ground and was constructed in the 1960's. The station generally pumps water from the Connecticut River to a storage reservoir at night, releasing the water during the day to generate power during high demand periods. The recreational facility includes a Visitor's Center that offers educational displays, coordinates tours and maintains picnic areas and trails for hiking, mountain biking and cross-country skiing.

The facility maintains two public water supply wells, Well A (01G - the back-up well) and Well B (02G - the main well). Well A has an 8-inch casing set within a 14-inch

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are may not be identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

casing located in an underground vault approximately 200 feet from the Visitor's Center. Well A is utilized only under high water demand conditions to maintain pressure in the storage tank. Well B is the main supply well and is located approximately 500 feet from the transmission switchyard and provides 85% to 95% of the total annual system demand. Well B has an 8-inch casing terminating 16-inches above the ground. The depth and construction details of the wells are not known, however, pump information indicates Well A is greater than 193 feet in depth. Based on that information and the location of Well B, on the side of a hill, both wells are assumed to extend into bedrock. The bedrock geology map shows the Poplar Mountain Formation gneiss underlies the area. The gneiss is a medium to fine-grained, gray to greenish gray foliated, micaceous gneiss.

Well A is approximately 110 feet from the rotary in the Visitor's Center parking area. Only passive recreational activities occur within the Zone I of Well A. Within the IWPA of Well A are the access road, parking, sewer lines and a septic tank. There are no fertilizers or pesticides utilized on the lawns at the facility. Well B is located south of the substation switchyard facility at a slightly lower elevation; a small drainage feature (swale) lies between the well and the switchyard. Well B is located on a natural bedrock feature while the switchyard is located upon an artificial highland constructed from rubble excavated during construction of the hydroelectric generating facility. There is passive recreation and a high-tension transmission main within the Zone I and IWPA of Well B. However, the IWPA for Well B terminates at the edge of the switchyard. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Therefore due to the proximity of the switchyard to the well, activities in the switchyard were also reviewed.

As noted above, both wells are located in a bedrock aquifer. Bedrock aquifers are considered to have a high vulnerability to potential contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Table 2 - Table of Land Uses Specific to Each Protection Area describes the activities identified during the assessment. Please refer to this table and the attached map of the Zone Is and IWPAs for more information.

The Water Quality

At this time, water from both wells does not require and is not treated. For current information on water quality monitoring results, please contact the Public Water System contact person listed above in Table 1.

Table 2: Table of Activities Specific to Each Protection Area

Water Supply Protection Area for Well A

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Visitor's Center	Sewer lines and septic components	No	Yes	Moderate	Sewer lines and septic tank in IWPA. See septic systems brochure in the appendix. Continue annual tank pumping.
	Access road and parking	No	Yes	Moderate	Continue minimal salt use and monitor area.

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Water Supply Protection Area for Well B

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Power Station	Power Transmission Lines	Yes	Yes	Low	Use only mechanical clearing or chemicals approved for IWPAs.

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a very few land uses and activities within the drinking water supply protection areas for Northfield Mountain & Visitor's Center wells that are potential sources of contamination. The overall ranking of susceptibility to contamination for the wells is moderate for Well A and low for Well B based on the presence of at least one moderate threat land use or activity in the IWPA for Well A, as seen in Table 2.

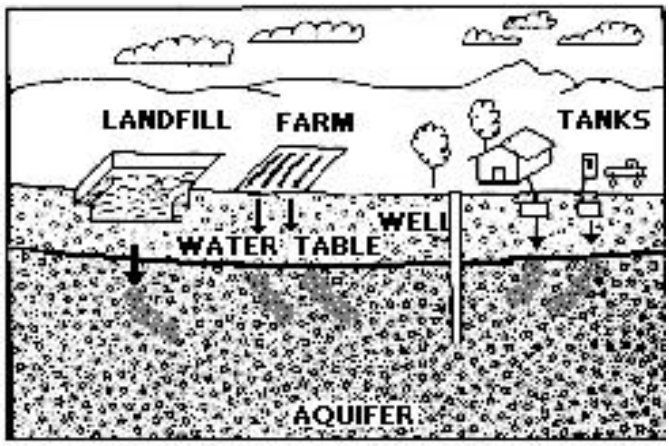

Figure 1: Example of how a well could become contaminated by different land uses and activities.

Key Land Use Issues for the Wells include:

1. **Ownership of Zone I, Well B**
2. **Access Road and Parking**
3. **Power Transmission Lines**

1. **Ownership of Zone I –** Although the Zone I is primarily forested with passive recreational activity and the transmission main through the area, Northeast Gen. Co. does not own the entire Zone I.

   - **Recommendation** – Investigate the potential for additional land purchase, entering into a Conservation Restriction or an agreement for Right of First Refusal upon sale of the land.

2. **Access Road and Parking** - The parking along the access road at the Visitor's Center within the IWPA of Well A constitutes a moderate threat due to the potential for accidental release of petroleum products. The parking in the rear of the facility has storm drains that discharge outside of the IWPA, away from the well, and is not included in the assessment.

   - **Recommendation** – Monitor vehicle parking area along the Visitor's Center access road and discourage parking in the turnaround proximal to the Zone I at Well A.

3. **Power Transmission Mains –** Vegetation control and maintenance activities pose a low threat to Well B.

   - **Recommendation** – Continue use of only mechanical methods or approved chemicals for vegetation control in IWPA and use caution when utilizing vehicles along transmission main.

In addition to being a public water system, Northeast Generation Company is registered with the MA DEP or EPA for the following: small quantity generator of waste oil/PCBs, very small generator of hazardous waste (other than oil), and minor surface water discharge. The surface water discharge is located well outside of the IWPA however, storage of petroleum products and hazardous waste generation are conducted within the switchyard. As previously noted, although the switchyard and its associated buildings are located outside of the IWPA for Well B, all activities were reviewed due to the close proximity of the IWPA. Petroleum products and hazardous materials stored near or proximal to the IWPA pose a potential threat of a release of large

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at: www..state.ma.us/dep/brp/dws.

quantities of fuel and other materials. Proper handling and containment minimizes the potential threat from these products.

The hazardous waste observed during the site visit was labeled and within secondary containment. One Aboveground Storage Tank (AST) for diesel fuel is located immediately adjacent to the IWPA and within a secondary containment structure. There is a 2,000-gallon diesel Underground Storage Tank (UST) for the emergency generator. The tank is a cathodically protected steel, double-walled tank with leak detection and overfill protection. During the assessment, several areas with floor drains were observed that were not connected to a tight tank or sewer. One area, the maintenance garage, contains hazardous materials. Following the site visit, the floor drains were investigated, assessed and have all been sealed in accordance with the MA DEP policy and regulations.

It should also be noted that the attached map inaccurately shows an underground storage tank near the access road to the Visitor's Center. Some time ago there was a garage with a UST in that vicinity. However, the garage and UST were dismantled and removed in 1983.

Implementing the recommendations below will reduce the system's susceptibility to contamination.

3. PROTECTION RECOMMENDATIONS

Northfield Mountain Station and Visitor's Center has fairly well protected wells. The MA DEP encourages limiting the activities near the wells and continued diligence in updating your protection measures. Northeast Generation Co. should review and adopt the following recommendations at the facilities:

Zone I:

- Keep non-water supply activities out of the Zone I.
- Erect water supply protection signs along the perimeter of the protection areas
- Consider additional land purchase, Conservation Restriction or Right of First refusal agreement for Zone I for Well B.
- Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- Direct road and parking lot drainage away from well, as feasible.
- Continue the current practice of not using pesticides, fertilizers or road salt within the Zone I.

Facilities Management:

- Continue standard operating procedures regarding proper storage, use and disposal of hazardous materials and emergency response.
- Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- Continue use of Best Management Practices (BMPs) for hazardous materials.
- Continue current practice of annual septic system inspection and maintenance. Refer to the appendices for more information regarding septic systems.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water supplier and town boards and will be made available on the DEP's web site.

Planning:

- Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws.
- Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. ATTACHMENTS

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure